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(54) **ELECTROPHORETIC, HIGH INDEX AND PHASE TRANSITION CONTROL OF TOTAL INTERNAL REFLECTION IN HIGH EFFICIENCY VARIABLE REFLECTIVITY IMAGE DISPLAYS**

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Related U.S. Application Data

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(51) Int. Cl.⁷ **G02B 6/26**

(52) U.S. Cl. **385/18; 385/16; 385/147; 385/901; 359/618; 349/63; 362/554**

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(57) ABSTRACT

Charged particles suspended in a medium such as Fluorinert™ Electronic Liquid are used to electrophoretically control total internal reflection (TIR) at a retro-reflective surface formed on a high refractive index material. Prismatic structures redirect ambient light from an overhead light source toward a display image and then from the image to the region in front of the image, yielding a high contrast reflective display. A transparent planar waveguide front lights the display with sequential flashes of red, blue and green light to generate a full color display. TIR can also be controlled at retro-reflective surfaces by means of a vapor-liquid phase transition, or by changing the absorption coefficient of a material using electrical, chemical and/or electrochemical methods.

60 Claims, 8 Drawing Sheets

